

Prepared with Cooperation from:
Window Craftsmen Inc.
6031 Clark Center Avenue
Sarasota, FL 34238

November 23, 2020

**Anchor Calculations:
Installation of Casement Window
In Wood or Concrete and Masonry Openings**

Window Series: CM200/201
Casement insulated and insulated impact window

Reference: Test reports: I6397.03-501-44 Issued 01/15/19
C1823.01-501-44 Issued 01/15/19
I3879.03-501-44 Issued 01/15/19
I3879.01-501-47 Issued 01/15/19

Testing Facility: Intertek
1140 Lincoln Avenue
Springdale, Pennsylvania 15144

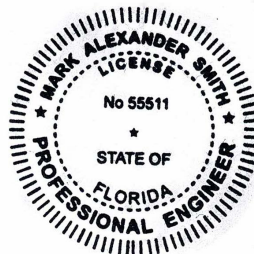
Test Standards: AAMA/WDMA/CSA 101/I.S. 2/A440-11
AAMA/WDMA/CSA 101/I.S. 2/A440-08
ASTM E1886-05
ASTM E1996-04/05/06
CSA A440S1-09

Specimen: 36" x 72" Vinyl Casement Window,

Glazing: 7/8" overall thickness, 1 lite of 1/8" annealed glass, a u shaped steel/butyl spacer and 1 lite of laminated glass which included 2 lites of 1/8" annealed glass with a .090 PVB interlayer
7/8" overall thickness,

Design Pressure: +50PSF/-50PSF

Mark A. Smith, P.E.
Florida No. 55511
3738 Kingswood Drive
Sarasota, FL 34232



Digitally signed
by Mark Smith
Date:
2020.11.23
10:23:35 -05'00'

Window Craftsmen, Inc.
CM200/201 Vinyl Casement Window

Notes:

Anchor calculations are based on approved installation instructions and:

- 1) Concrete or masonry substrate where one by, non-structural, wood bucking is employed, use 3/16" ITW Tapcon anchors of sufficient length to achieve a minimum embedment of 1-1/4" into concrete or masonry.
- 2) Concrete substrate where wood bucking is not employed, use 3/16" ITW Tapcon anchors of sufficient length to achieve a minimum embedment of 1-1/4" into concrete or masonry.
- 3) Wood Frame substrate, use #10 wood screws of sufficient embedment of 1-1/2" into wood framing.
- 4) Maximum allowable shim thickness shall be 1/4". A load bearing shim shall be located at each anchor.
- 5) Anchor calculations and analysis comply with the current Florida Building Code.

Tested Installation Anchor Information

Two (2) #8 x 2.5" Pan head screws were used to fasten the jambs into a wooden test buck. Two (2) in each frame jambs located at 4.00" from the head and 5" from the sill in each jamb. The test specimen was sealed to the wood buck with silicone sealant.

Anchors to be qualified:

1. #10 wood screws for installation in wood substrates.
2. 3/16" ITW Tapcons for installation in concrete and masonry substrates.

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Anchor Calculations:

#10 wood screw
1-1/2" embedment

Head

Shear:

Proof load 80 ksi
Root diameter = .150 in.
Allowable Shear=353 pounds
NDS min lateral load in wood with metal for #10 wood screw is 121 pounds

Bending:

Allowable bending stress=64 ksi
Cantilever=.250" , Moment arm=.125
Allowable bending load=173 pounds

Jamb

Shear:

Proof load 80 ksi
Root diameter = .150 in.
Shear=353 pounds
NDS min lateral load in wood with metal for #10 wood screw is 121 pounds

Bending:

Allowable bending stress=64 ksi
Cantilever=.250" , Moment arm=.125
Allowable bending load=173 pounds

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3/16" Tapcon

1-1/4" embedment
2000psi concrete

Head

Shear:

Yield Strength = 92 ksi
Allowable shear stress 23 ksi
Allowable shear load = 406 pounds
Allowable lateral load = 170 pounds

Bending:

Root dia=.150
Allowable bending stress=73.6 ksi
Cantilever=.250" , Moment arm=.125
Allowable bending load=195 pounds

Jambs

Shear:

Yield Strength = 92 ksi
Allowable shear stress 23 ksi
Allowable shear load = 406 pounds
Allowable shear= 170 pounds

Bending:

Root dia=.150
Allowable bending stress=73.6 ksi
Cantilever=.250" , Moment arm=.125
Allowable bending load=195 pounds

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Model 200/201 Vinyl Casement Window

Load on 36" head and sill:
Area=324 square in=2.250 square feet
Design pressure= 50psf
Total load = 112.5 pounds

Load on 72" Jambs:
Area=972 square in=6.75 square feet
Design Pressure= 50psf
Total load= 337.5 pounds

Minimum Anchors required, #10 wood screw:

Spacing, Locations End Distance & # of Anchors/Location:

Head and sill: 24"	2 Locations	6" End Distance	1 Anchor/Loc
Frame Jambs: 30"	3 Locations	6" End Distance	1 Anchors/Loc

Verify Anchor Locations Required exceeds # of Anchor Locations during Testing:

Head and sill:	2 Locations Required =>	0 Locations Tested
Frame Jambs:	3 Locations Required =>	2 Locations Tested

#10 Wood Anchor:

Head Capacity:	242 lbs.	>	112.5 lbs.	OK
Jamb Capacity:	363 lbs.	>	337.5 lbs.	OK

Dade Shear and Bending Load screw

$(f_b/F_b) + (f_v/F_v)^2 \leq 1.0$
Head: $(0.325) + (0.159)^2 = (0.350) < 1.0$
Jambs: $(0.650) + (0.319)^2 = (0.752) < 1.0$

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Minimum Anchors required, 3/16 Tapcon:

Spacing, Locations End Distance & # of Anchors/Location:

Head: 24"	2 Locations	6" End Distance	1 Anchors/Loc
Frame Jambs: 30"	3 Locations	6" End Distance	1 Anchors/Loc

Verify Anchor Locations Required exceeds # of Anchor Locations during Testing:

Head:	2 Locations Required =>	0 Locations Tested
Frame Jambs:	3 Locations Required =>	2 Locations Tested

3/16" Tapcon:

Head Capacity:	340 lbs.	>	112.5 lbs	OK
Jamb Capacity:	510 lbs.	>	337.5 lbs.	OK

Dade Shear and Bending Load on screw

$$(fb/Fb)+(fv/Fv)^2 \leq 1.0$$

$$\text{Head: } (0.288)+(0.139)^2=(0.307) < 1.0$$

$$\text{Jambs: } (0.577)+(0.277)^2=(0.654) < 1.0$$

Anchor Locations Required (36" X 72") # 10 wood screw and 3/16" Tapcon:

Spacing, Locations End Distance & # of Anchors/Location:

Head: 24"	2 Locations	6" End Distance	1 Anchors/Loc
Frame Jamb: 30"	3 Locations	6" End Distance	1 Anchors/Loc

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